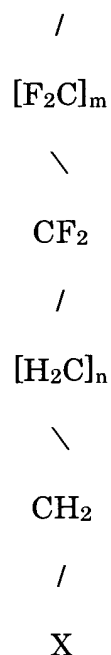


Claims

- (1) A method of fabricating a self-assembled monolayer of a substance on a substrate comprising depositing the substance on the substrate using compressed carbon dioxide as the solvent medium for the substance.
- (2) A method as claimed in claim 1, wherein the pressure and/or temperature of the compressed carbon dioxide is/are selectively controlled so as to enhance the density of the self-assembled monolayer on the substrate.
- (3) A method as claimed in claim 1 comprising the use of a co-solvent in combination with the compressed carbon dioxide.
- (4) A method as claimed in claim 3, wherein the co-solvent comprises at least one of H_2O , CH_3OH , CF_3OH , $\text{CF}_3\text{CH}_2\text{OH}$, $\text{CF}_3\text{CF}_2\text{OH}$, $(\text{CF}_3)_2\text{CHOH}$, CH_4 , C_2H_4 , C_2F_6 , CHF_3 , CClF_3 , C_2H_6 , SF_6 , Propylene, Propane, NH_3 , Pentane, $i\text{PrOH}$, MeOH , EtOH , $i\text{BuOH}$, Benzene, Pyridine.
- (5) A method as claimed in claim 1, wherein the substrate comprises a metallic substance.
- (6) A method as claimed in claim 5, wherein the metallic substance comprises at least one of gold, silver, copper, iron, mercury, palladium, gallium arsenide, ferrous oxide, indium tin oxide.
- (7) A method as claimed in claim 6, wherein the substance comprises a semi-fluorinated sulphur containing compound of the formula:



Where X comprises R-SH, RS-SR or R-S-R, where R denotes the rest of the molecule;

Y comprises a functional group; and

m and n denote respectively the number of fluorinated and non-fluorinated carbon atoms.

- (8) A method as claimed in claim 7, wherein X comprises a disulphide of sulphur.
- (9) A method as claimed in claim 7, wherein X comprises a thiol.
- (10) A method as claimed in claim 7, wherein Y comprises a CF₃ functional group.
- (11) A method as claimed in claim 7, wherein m and n lie within the range of 1 to 20.

(12) A method as claimed in claim 11, wherein m and n lie within the range of 5 to 10.

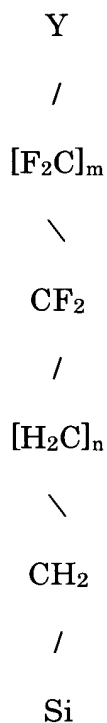
(13) A method as claimed in claim 12, where m is 8 and n is 10.

(14) A method as claimed in claim 7, wherein Y further comprises at least one of vinyl, styryl, acryloyl, methacryloyl or alkyne in combination with a spacer group.

(15) A method as claimed in claim 14, wherein the spacer group comprises at least one of CH₂ or CF₂.

(16) A method as claimed in claim 1, wherein the substrate comprises at least one of glass, mica, SiO₂, Al₂O₃, Ga₂O₃ or ITO.

(17) A method as claimed in claim 16, wherein the substance comprises a semi-fluorinated silane derivative of the formula:



where Y comprises a functional group; and

m and n denote respectively the number of fluorinated and non-fluorinated carbon atoms.

(18) A method as claimed in 17, wherein Si comprises a trialkoxy derivative.

(19) A method as claimed in claim 18, wherein Si comprises at least one of SiCl_3 , $\text{Si}(\text{OCH}_3)_3$, $\text{Si}(\text{OCH}_2\text{CH}_3)_3$, $\text{Si}(\text{OCH}_3)_2\text{Cl}$ or $\text{Si}(\text{CH}_2\text{CH}_3)_2\text{Cl}$.

(20) A method as claimed in claim 17, wherein Y comprises a CF_3 functional group.

(21) A method as claimed in claim 17, wherein m and n lie within the range of 1 to 20.

(22) A method as claimed in claim 21, wherein m and n lie within the range of 5 to 10.

(23) A method as claimed in claim 22, wherein m is 6 and n is 1.

(24) A method as claimed in claim 17, wherein Y further comprises at least one of vinyl, styryl, acryloyl, methacryloyl or alkyne in combination with a spacer group.

(25) A method as claimed in claim 24, wherein the spacer group comprises at least one of CH_2 or CF_2 .

(26) A method as claimed in claim 1, wherein the self-assembled monolayer has an ellipsometry thickness of about 30\AA and a water contact angle of about 110° .

(27) An inkjet head comprising a self-assembled monolayer as claimed in any one of claims 1 to 15 or claim 26, when appendant to any one of claims 1 to 15.

- (28) An electronic, optical or optoelectronic device comprising a self-assembled monolayer as claimed in any one of claims 1 to 5 or claims 16 to 26 or claim 26 when appendant to any one of claims 1 to 5, or 16 to 25.
- (29) A device as claimed in claim 28 comprising a thin film transistor or an organic semiconductor device, or a light emitting diode.
- (30) A device as claimed in claim 29, wherein the light emitting diode comprises an organic polymer light emitting diode.